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Comments on Atlantic Richfield Company's Surface Water Technical Data Summary Report and Response to U.S. EPA and LRWQCB Comments on the Report Titled Evaluation of Historical and RI\FS Surface Water Data, Leviathan Mine Site, Alpine County, California

Thank you for the opportunity to review Atlantic Richfield Company's (AR) March 14, 2016, *Surface Water Technical Data Summary Report and Response to U.S. EPA and LRWQCB Comments on the Report titled Evaluation of Historical and RI\FS Surface Water Data* for the Leviathan Mine Site. The California Regional Water Quality Control Board, Lahontan Region (Water Board) staff has the following comments and questions:

1. Table 2, Comment 10, AR Response. The last sentence states, "Groundwater discharges to surface water including uncaptured groundwater emerging in the vicinity of the Delta Seep will be addressed through the broader investigation of groundwater-surface water interactions as described in Amendment No. 11 to the On-Property FRI Work Plan." It does not appear that Amendment 11 describes any activities to investigate the uncaptured portion of the Delta Seep. Please identify those sections of Amendment 11 in which proposed activities for the investigation of the uncaptured portion of the Delta Seep are specified.

2. Table 2, Comment 11, AR Response. The last sentence states, "Atlantic Richfield has conducted comparisons of flow measurements conducted by Atlantic Richfield and the USGS, but these comparisons were not presented in the report as they were considered beyond the scope of the data evaluation presented." Water Board staff has noted your response, but given the importance of flow data upon conclusions drawn from the RI/FS surface water data, staff views the documentation of flow measurement comparisons as an opportunity to resolve discrepancies between the data sets early in the RI/FS process, rather than propagating unresolved discrepancies.

3. Table 2, Comment 35, AR Response. It does not appear that the figure legends for Figures 6-4 and 6-5 have been updated to include the dates for the data.

4. Table 2, Comment 36, AR Response. It does not appear that the figure legends for Figures 6-21 and 6-23 have been updated to include the dates for the data.

5. Page ES-7. The 6th bulleted paragraph states, "Groundwater-surface water interactions in reaches of Leviathan Creek downstream to the vicinity of the confluence between Leviathan and Aspen creeks in the On-Property Study area should be further investigated as described in Amendment No. 11 to the On-Property FRI Work Plan (Atlantic Richfield, 2016)." This statement does not define the upstream extent of further investigation. Based on AR's response to LRWQCB comments dated August 4, 2015, (Comment 10), it appears the reach for additional investigation will extend far enough upstream to enable investigation of the uncaptured portions of the Delta Seep emerging in the vicinity of the Delta Seep; however, it does not appear that Amendment 11 describes further investigation activities this far upstream. Please clarify.

6. Page 15, Section 4.1.2.2, second paragraph in this section. The first sentence states, "Groundwater elevations measured in these wells show that groundwater flow generally mimics the topography of the site, and that groundwater flow may be affected by mining-related features (ponds, tunnels and drains) at the site." This statement should be rephrased to explain that groundwater flow may be affected by mining-related **and post mining abatement-related** features, including: waste piles, tunnels, drains, and ponds.

7. Page 17, first paragraph on this page, third sentence. It should be noted that a portion of the Delta Seep is not captured and that the uncaptured portion of the Delta Seep discharges continuously to Leviathan Creek.

8. Page 17, second paragraph on this page, first sentence. It should be noted that recent beaver dam activity in this area periodically causes Leviathan Creek to back up and engulf the acidic pond.

9. Page 17, 5th paragraph on this page. The first sentence states, "Current acid drainage management at LMS includes year round containment and campaign treatment of acid drainage from the Adit and PUD, seasonal interception and treatment of acid drainage discharged from the CUD and Delta Seep during late spring, summer, and early fall, and year round treatment of the Aspen Seep." It should be clarified that the current acid drainage management includes seasonal interception and treatment of a <u>portion</u> of the Delta Seep.

10. Page34, Section 5.3.1. To improve clarity, Water Board staff recommends including a figure that illustrates the information presented in box plots.

11. Page37, Section 6.0, fourth bulleted paragraph, last sentence. The subject sentence should be modified to state, "In years 2000-<u>2015</u>, this program resulted in the intermittent discharge of treated AD to Leviathan Creek generally between May 1 and October 1."

12. Page38, third bulleted paragraph on this page. The second sentence states, "Atlantic Richfield has been seasonally capturing and treating waters from the CUD and DS since 2002 with the exception that capture and treatment of the DS was suspended from 2004 through 2006 due to debris flow on the Delta Slope located upslope from the DS." It should also be stated that CUD capture and treatment was suspended in late- August 2006 for 9 days during a shutdown of AR's Pilot HDS Plant.

13. Page42, Section 6.1.1, third paragraph on this page, second sentence. It appears the reference to Figure 3-10 should refer to Figure 6-10.

14. Page43, last paragraph on this page. The last sentence states, "The decreases observed after 2008 are thought to result from 1) elevated concentrations in 2005 and 2006 because discharges from the DS were not being captured due to slope instability, and 2) more consistent and reliable capture of discharges from the DS and CUD and extended treatment times." Also it should be noted that water quality in 2006 was also deleteriously impacted by discharge associated with the loss of CUD capture and treatment in late-August 2006.

15. Page44, Section 6.2. Water Board staff recommends including a discussion regarding any noted trends between SW-9 and SW-10 during monitoring events 2 and 3 in 2012 and 2013. The data show a decrease in pH and an increase in the concentration of some metals between SW-9 and SW-10 during monitoring events 2 and 3.

16. Page47, Section 7.1, fourth paragraph, last sentence. Water Board staff recommends adding a statement to clarify that the CUD and Delta Seep discharge to Leviathan Creek during the fourth event.

17. Page51, Section 7.3, first paragraph. The second to last sentence states, "Total concentrations measurements are used to evaluate potential human and ecological risk as described in Section 11 because they are considered to be more representative of total exposures by potential receptors." This statement is contradicted in Table 2, Comment 17, AR Response, last sentence where it is stated, "…total concentrations are considered potentially applicable to human receptors and dissolved concentrations are considered relevant for aquatic species. Please clarify.

18. Page53, Section 7.3.2. Water Board staff recommends including a discussion regarding any detected mass loading between SW-9 and SW-10. Mass loading is expected to occur between these monitoring locations due to the uncaptured portion of the Delta Seep. Data from monitoring events 2 and 3, when the Delta Seep capture system is in operation, would be particularly useful in evaluating mass loading from the uncaptured portion of the Delta Seep.

19. Page69, Section 9.1, second paragraph. The first sentence references Table 9-1 but Table 9-1 has not been provided in the Report.

20. Page 7-1, second bulleted paragraph. The uncaptured portion of the Delta Seep and its apparent impact on Leviathan Creek should also be mentioned here.

21. Appendix 7-C includes graphs of dissolved metal concentrations. These same graphs show the MCL. The MCL represents the highest permissible concentration of a substance allowed in drinking water. Since the total metal concentration of a water sample includes both the dissolved and solid fraction of a metal in the sample and the dissolved metal concentration only includes the dissolved fraction of a metal in the sample, it appears that it would be most appropriate to graph the MCL alongside total metal concentrations. Water Board staff recommends adding graphs of total metal concentrations and the MCL.

22. Tables 7-2A and 7-2B. Footnote #1 should be revised to reference Appendix 5-C.

23. Table 10-1. Numeric values have not been provided in three of the cells in the column titled "Range of Preliminary Reference Values." Also, it appears that the reference to "groundwater" in footnote #1 needs to be changed to "surface water."

If you have any questions regarding the above comments, please contact Chris Stetler, Senior Water Resources Control Engineer, at chris.stetler@waterboards.ca.gov or (530) 542-5572, or me at douglas.carey@waterboards.ca.gov or (530) 542-5468.

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